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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,106	08/01/2003	Takeo Kuramoto	1049/HIROSE	3474
27649	7590	11/03/2004	EXAMINER PHAM, HOAI V	
MICHAEL TOBIAS #40 1717 K ST. NW, SUITE 613 WASHINGTON, DC 20036			ART UNIT 2814	PAPER NUMBER

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/632,106

Applicant(s)

KURAMOTO ET AL.

Examiner

Hoai v Pham

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 16-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/1/03; 1/28/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restriction***

1. Applicant's election with traverse of claims 1-15 to the response to restriction requirement mailed on July 30, 2004 is acknowledged. The traversal is on the ground(s) that (A) The inventions must be independent or distinct as claimed; and (B) There must be a serious burden on the examiner if restriction is required. This is not found persuasive because

- a) The solder ball in claim 16 can be made of polysilicon which is different material than metal, plastic, plated plastic or ceramic as claimed in claim 15.
- b) The above two different classifications show the need for two entirely different fields of a search.
- c) The inventions are in different statutory classes which have different case law basis for examination.
- d) Non-restriction would mean that if one of the inventions were held to be unpatentable then the other would also be inherently held to be unpatentable. Therefore, restriction is proper since there are apparently two different inventive concepts in making the device and in the device itself.

The requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 9, 10, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimada et al. [U.S. Pat. 6,087,597].

With respect to claim 1, Shimada et al. (fig. 2, cols. 3-4) discloses a solder ball (11) assembly comprising a mask (21) having first and second sides and a plurality of holes formed therein, each hole having a first end opening onto the first side of the mask and a second end, a plurality of solder balls (11) disposed in the holes, and a fixing agent (13) securing the solder balls in the holes.

With respect to claim 9, Shimada et al. discloses that each hole has a diameter at its first end which is at least the diameter and less than two times the diameter of the solder ball (11) disposed therein (see fig. 2).

With respect to claim 10, Shimada et al. discloses that each hole is tapered from its first end towards its second end (see fig. 2).

With respect to claim 13, Shimada et al. discloses that the second end of each hole extends to the second side of the mask (21) (see fig. 2).

With respect to claim 15, Shimada et al. (fig. 2, cols. 3-4) discloses that a ball assembly comprising a mask (21) having first and second sides and a plurality of holes formed therein, each hole having a first end opening onto the first side of the mask and a second end, a plurality of balls (11) disposed in the holes, and a fixing agent (13) securing the balls in the holes, the balls comprising a material selected from metal.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3, 4, 8, 11, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Inoue et al. [U.S. Pat. 6,460,755].

With respect to claim 1, Inoue et al. (fig. 38, cols. 15-16) discloses a solder ball (61) assembly comprising a mask (318) having first and second sides and a plurality of holes (316) formed therein, each hole having a first end opening onto the first side of the mask and a second end, a plurality of solder balls (61) disposed in the holes, and a fixing agent (70) securing the solder balls in the holes.

With respect to claim 3, Inoue et al. discloses that each solder ball (61) protrudes from the first side of the mask (see fig. 38).

With respect to claim 4, Inoue et al. discloses that the fixing agent (70) has a fluxing action (see col. 16, line 1).

With respect to claim 8, Inoue et al. discloses that each hole has a depth which is less than two times the diameter of the solder ball disposed in the hole (see fig. 38).

With respect to claim 11, Inoue et al. discloses that each hole is cylindrical (see fig. 38).

With respect to claim 12, Inoue et al. discloses that the second end of each hole (316) is spaced from the second side of the mask (see fig. 38).

6. Claims 1-3, 6, 7, 9, 11, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Chang et al. [U.S. Pat. 6,596,620].

With respect to claim 1, Chang et al. (fig. 2, cols. 3-4) discloses a solder ball (27) assembly comprising a mask (22) having first and second sides and a plurality of holes formed therein, each hole having a first end opening onto the first side of the mask and a second end, a plurality of solder balls (27) disposed in the holes, and a fixing agent (21) securing the solder balls in the holes.

With respect to claim 2, Chang et al. discloses that a protective sheet (26) attached to the first side of the mask and covering the first end of each of the holes (see fig. 2).

With respect to claim 3, Chang et al. discloses that each solder ball (27) protrudes from the first side of the mask (see fig. 2).

With respect to claim 6, Chang et al. discloses that including a parting agent (21) disposed between the mask (22) and the protective sheet (26) (see fig. 2).

With respect to claim 7, Chang et al. discloses that a protective sheet attached to the second side of the mask (22) and covering the second end of each of the holes (see fig. 2).

With respect to claim 9, Chang et al. discloses that each hole has a diameter at its first end which is at least the diameter of the solder ball (27) disposed therein (see fig. 2).

With respect to claim 11, Chang et al. discloses that each hole is cylindrical (see fig. 2).

With respect to claim 13, Chang et al. discloses that the second end of each hole extends to the second side of the mask (22) (see fig. 2).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. [U.S. Pat. 6,460,755] in view of Klein [U.S. Pat. 6,084,781].

Inoue et al. substantially discloses all the limitation as claimed above except the fixing agent is at least one substance selected from the group consisting of rosin adhesives, polyethylene glycol adhesives, acrylic adhesives, rubber adhesives, polyester adhesives, polyvinyl acetate adhesives, and urethane adhesives. However,

Klein discloses that the fixing agent is rosin (see col. 7, lines 1-6). Therefore, it would have been obvious to one having ordinary skill in the art to use rosin as taught by Klein into the device of Inoue et al. in order to maintain the position of the solder ball within the hole (see col. 7, lines 1-6).

10. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada et al. [U.S. Pat. 6,087,597] in view of Sota [U.S. Pat. 6,201,707].

Shimada et al. discloses that the mask (21) is formed of a polyimide. Shimada et al. does not disclose the mask comprising a material selected from the group consisting of photosensitive resin compositions, plastics, ceramics, paper, metal, and glass-epoxy composites. However, Sota discloses that these materials, polyimide, ceramics, paper, and glass-epoxy are known materials in the art for forming the mask (insulating base plate)(5) (see col. 5, lines 24-32). Therefore, it would have been obvious to one having ordinary skill in the art to select ceramics, paper, and glass-epoxy as known materials, as taught by Sota, into the device of Shimada et al. to form the mask with superior in heat resistance. Moreover, selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

**Conclusion**

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai v Pham whose telephone number is 571-272-1715. The examiner can normally be reached on M-F.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HOAI PHAM  
PRIMARY EXAMINER